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Research Interests

- Language interoperability and component frameworks
- Software architecture
- Scripting languages
- Nonlinear programming for optimization of physical systems
- High-performance computing
- Process flowsheeting and optimization

Education

Ph.D. Chemical Engineering/ Minor Computer Science, University of Wisconsin, Madison, May 1995
B.S. Chemical Engineering, Carnegie-Mellon University, Pittsburgh, PA, May 1988

Professional Experience

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| 6/10-present | Computer Science Group Leader, Lawrence Livermore National Laboratory, Livermore, CA |
| 3/00–6/10 | Computer Scientist, Components Project Leader, Lawrence Livermore National Laboratory, Livermore, CA |
| 6/96–2/00 | Senior Development Engineer, Aspen Technology, Inc., Ten Canal Park, Cambridge, MA |
| 6/95–6/96 | Research Associate (post-doc), IRC for Process Systems Engineering, Imperial College, London, England |
| 9/90–5/91 | Teaching Assistant, Chemical Engineering, University of Wisconsin-Madison, Madison, WI |
| 9/88–9/90 | Research Assistant, Chemical Engineering, University of Wisconsin-Madison, Madison, WI |
| 5/87–8/88 | Researcher, Engineering Design Research Center, Carnegie-Mellon University, Pittsburgh, PA |

Honors and Organizations

- 2006 R&D 100 Award
- U.S. Department of Energy Computational Science Fellow
- Carnegie-Mellon University Research Honors
- Member, Association for Computing Machinery (ACM)
- Tau Beta Pi academic honor society
- Lambda Sigma Sophomore Honor Society

Selected Publications and Presentations

Epperly, T., et al, High-performance language interoperability for scientific computing through Babel. The International Journal of High Performance Computing Applications, August, 2012.

Epperly, T., et al, "High-performance Computing for Electric Grid Planning and Operations" IEEE Power & Energy Society General Meeting, San Diego, July, 2012.

Ebner, D. and T. Epperly, Fast native function calls for the Babel language interoperability framework, Workshop on Component-Based High Performance Computing (CBHPC) Proceedings of the 2010 11th IEEE/ACM International Conference on Grid Computing, Brussels, Belgium, October 25-29, 2010.

Cary, J.R., T Epperly, et al, "Concurrent, parallel, multiphysics coupling in the FACETS project," SciDAC 2009, J. Physics: Conf. Series 180, 012056 (2009).

Cary, J., T. Epperly et al. First results from core-edge parallel composition in the FACETS project. In Journal of Physics: Conference Series 125 2008.

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- Muszala, S. , T. Epperly and N. Wang. Babel Fortran 2003 Binding for Structured Data Types. In Jack Dongarra and Anne C. Elster and Jerzy Wasniewski, (eds.) Applied Parallel Computing: 9th International Conference, PARA 2008, Trondheim, Norway, 13-16 May, 2008 Lecture Notes in Computer Science Springer Berlin / Heidelberg. (In Press) 2008.
- Cary, J.R., T. Epperly et al. First results from core-edge parallel composition in the FACETS project. In Journal of Physics: Conference Series 125 2008.
- Cary, J.R., T. Epperly et al.. Introducing FACETS, the Framework Application for Core-Edge Transport Simulations. In Journal of Physics: Conference Series 78 2007.
- Panas T., T. Epperly, D. Quinlan, A. Saebjornsen, and R.. Vuduc. Communicating Software Architecture using a Unified Single-View Visualization. In 12th International Conference on Engineering of Complex Computer Systems (ICECCS 2007), 10-14 July 2007, Auckland, New Zealand, pp. 217-228. IEEE Computer Society. 2007.
- Parker, S., R. Armstrong, D. Bernholdt, T. Dahlgren, T. Epperly, J. Kenny, M. Krishnan, G. Kumfert, J. Larson, L. Curfman McInnes, J. Nieplocha, J. Ray, S. Shasharina. Enabling Advanced Scientific Computing Software. CTWatch Quarterly 3(4) (2007). Invited article.
- Kumfert, G. and T. Epperly, "Introductory Babel for Massive Supercomputing Software Integration" Tutorial S08, Supercomputing 2007, Reno, NV, November 2007.
- Kumfert, G., J. Leek, and T. Epperly, "Babel Remote Method Invocation," Proceedings of IEEE International Parallel and Distributed Processing Symposium (IPDPS '07), Long Beach, CA, USA, March 26-30, 2007.
- Kumfert, G., D. E. Bernholdt, T. G. W. Epperly, J. A. Kohl, L. C. McInnes, S. G. Parker, and J. Ray. "How the Common Component Architecture Advances Computational Science," in Journal of Physics: Conference Series, Proceedings of SciDAC 2006, Denver, CO, USA June 25-29, 2006. W. M. Tang *et al* eds. Vol 46 pp 479-493.
- Bernholdt, D. E., B. A. Allan, R. Armstrong, F. Betrand, K. Chiu, T. L. Dahlgren, K. Damevski, W. R. Elwasif, T. G. W. Epperly, M. Govindaraju, D. S. Katz, J. A. Kohl, M. Krishnan, G. Kumfert, J. W. Larson, S. Lefantzi, M. J. Lewis, A. D. Malony, L. C. McInnes, J. Nieplocha, B. Norris, S. G. Parker, J. Ray, S. Shende, T. L. Windus, and S. Zhou. "A Component Architecture for High-Performance Scientific Computing, *Intl. J. High-Perf. Computing Appl.* **20** (2006).
- Armstrong, R., G. Kumfert, L. C. McInnes, S. Parker, B. Allan, M. Sottile, T. Epperly, and T. Dahlgren. "The CCA Component Model for High-Performance Scientific Computing. *The International Journal of Concurrency and Computation: Practice and Experience* **18**(2) (February 2006).
- Epperly, *et al*, Component Software for High-Performance Computing: Using the Common Component Architecture, Supercomputing 2005 Tutorial M-02, November 2005.
- Quinlan, D. Q. Yi, G. Kumfert, T. Epperly, T. Dahlgren, M. Schordan, and M. White, "Toward the Automated Generation of Components from Existing Source Code," Second Workshop on Productivity in High-End Computing, San Francisco, CA, USA, February 13, 2005. Proceedings of the 2nd Workshop on Productivity and Performance in High-End Computing, pp. 12-19, 2005.
- Epperly, Tom and Gary Kumfert, "Bridging Programming Languages with Babel: Parts I and II", Supercomputing 2004 Tutorial S-03, November 2004.
- Dubois, Paul, Tom Epperly and Gary Kumfert, "Why Johnny can't build", *Computing in Science & Engineering*, (2003) **5**:83-88.
- Bernholdt, David, Wael Elwasif, James Kohl, and Thomas Epperly, "A Component Architecture for High Performance Computing", in *Proceedings of the Workshop on Performance Optimization via High-Level Languages and Libraries* (POHLL-02), 2002.
- Epperly, Tom, Scott Kohn, and Gary Kumfert, "Component Technology for High-Performance Scientific Simulation Software," *Software Architecture for Scientific Computing Applications*, Int. Federation for Information Processing, Ottawa, Ontario, Canada, October 2-4, 2000. (UCRL-JC-140549*).
- Kumfert, Gary, Tamara Dahlgren, Tom Epperly, and Scott Kohn, *Babel Users' Guide*. (UCRL-MA-145991*).
- Epperly, T.G.W., M. G. Ierapetritou, and E. N. Pistikopoulos. "On the global and efficient solution of stochastic batch plant design problems." *Computers and Chemical Engineering*, (1997) **21**:1411–1421.
- Epperly, T.G.W. and E.N. Pistikopoulos. "A reduced space branch and bound algorithm for global optimization." *The Journal of Global Optimization*, (1997) **11**:287–311, 1997.
- Epperly, T.G.W. and R.E. Swaney. "Branch and bound for global NLP: New bounding LP." In *Global Optimization in Engineering Design, chapter 1*. (1996) Kluwer.
- Epperly, T.G.W. and R.E. Swaney. "Branch and bound for global NLP: Iterative LP algorithm and results." In *Global Optimization in Engineering Design, chapter 2*. (1996) Kluwer.

Epperly, T.G.W., "Global Optimization of Nonconvex Nonlinear Programs Using Parallel Branch and Bound (long)." PhD thesis, University of Wisconsin-Madison, Madison, WI 53706, May 1995.

Westerberg, A.W., P.C. Piela, R.D. McKelvey, and T.G. Epperly. "The ASCEND modeling environment and its implications." In *Proceedings Of The 4th International Symposium On Process Systems Engineering*, 1 (August 1991) pp I.2.1–I.2.12, Montebello, Quebec Canada.

Piela, P.C., T.G. Epperly, K.M. Westerberg, and A.W. Westerberg. "ASCEND: An object oriented computer environment for modeling and analysis. Part 1 - The modeling language,". *Computers And Chemical Engineering*, (1991) 15(1): 53–72,.